

E²⁰A₃
(aromatic modified aliphatic hydrocarbon resin made by Exxon-Mobile Chemical Company), Escorez[®] 5000 series (hydrogenated hydrocarbon resins made by Exxon-Mobile Chemical Company), and poly(vinylidene fluoride-hexafluoropropene) "PVdF-HFP" and combinations thereof. The poly(vinylidene fluoride-hexafluoropropene) preferably has a weight content of hexafluoropropene in the range of from about 5 to about 12%.

A⁷
[0050] Some of the microporous membrane samples made as described above were subjected to characterization including thickness, basis weight, mean of pore size, and porosity. Data relating to Sample Nos. 4, 8, 11, 12 are set forth in Table 2. The commercial product Celgard[®] 2300 were also tested as a control and are set forth in the same table.

[0051] The medium value of pore size of microporous membranes as recorded in Table 2 was determined by porometry. Each of these four samples have much higher porosity than Celgard[®] 2300. It is believed that higher porosity of the microporous membrane can result in higher charging-discharging rate capability of battery.

A⁵
[0059] The discharge-recharge cycle performance results of these three batteries are also shown in Fig. 2. The figure shows percent total discharge capacity when the batteries are discharged at various current rate levels for batteries No.1 (circle) and 2 (square), and also Battery No. 3 (triangle) for comparison. Both batteries Nos. 1 and 2 offered higher discharging rate capability than the control battery.

IN THE TITLE

MARKED UP COPY OF AMENDED TITLE:

MICROPOROUS MEMBRANE AND ITS USES THEREOF

MARKED-UP COPY OF AMENDED SPECIFICATION PARAGRAPHS:

[0007] However, as the lithium salts used in Sun is sensitive to moisture ~~and oxygen~~, the battery assembly operation has to be performed under anhydrous conditions, for example, in dry box under a nitrogen or an argon or in dry room. This substantially increases the cost of producing these types of batteries.

[0020] In a preferred embodiment, the microporous membrane further comprises a tackifier, preferably in an amount from about 0 to about 50% by weight, more preferably from about 2 to about 30%, and the most preferably from about 5 to about 10%. The tackifier is preferably selected from the group consisting of hydrocarbon resin, such as Escorez[®] 2000 series (aromatic modified aliphatic hydrocarbon resin made by Exxon-Mobile Chemical Company), Escorez[®] 5000 series (~~eye~~aliphatic~~hydrogenated~~ hydrocarbon resins made by Exxon-Mobile Chemical Company), and poly(vinylidene fluoride-hexafluoropropene) "PVdF-HFP" and combinations thereof. The poly(vinylidene fluoride-hexafluoropropene) preferably has a weight content of hexafluoropropene in the range of from about 5 to about 12%.

[0050] Some of the microporous membrane samples made as described above were subjected to characterization including thickness, basis weight, mean of pore size, and porosity. Data relating to Sample Nos. 4, 8, 11, 12 ~~were measured by porosimetry and~~ are set forth in Table 2. The commercial product Celgard[®] 2300 were also tested as a control and are set forth in the same table.

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